

## ABSTRACT OF THE DISCLOSURE

A linear engine, comprising a tubular housing, axially spaced electromagnetic coils disposed around the tubular housing, a piston disposed within the tubular housing, the piston including magnetic elements, and a drive circuit electrically connected to the first and second electromagnetic coils for sequentially energizing the first and second electromagnetic coils to reciprocate the piston within the tubular housing. A magnetic sleeve is disposed within each coil, with the piston being arranged to pass through the magnetic sleeves during operation and the magnetic sleeves being separated by nonmagnetic material. The magnetic sleeves each form part of the tubular housing. Sealed bearings at each end of the piston define a sump for retaining lubricating oil within a reduced diameter portion of the piston. The sealed bearings each comprise axially spaced circumferentially extending ribs, adjacent ribs being separated by a gap for receiving a sealing element.